

تفريغ لاب عقاقيير

اسم الموضوع: Introduction
إعداد الصيدلاني/ة: حلا العبويني



In Lab.1: Introduction

A. Tissues and Tissue Systems:

When cells are grouped together for an identical function, a tissue is formed. In the plant body, the following three tissue systems can be distinguished:

في النبات

1-Ground Tissue System: (Basic Cell Types)

It consists of simple cells, which may be thickened. It represents ground tissue made up of parenchyma, collenchyma and sclerenchyma; it includes cortex, hypodermis, pith, mesophyll and portion of midrib of leaves.

الطبقة الخارجية من النبات والجذر

A. Parenchyma:

Parenchyma is the simplest and most common type of cell.

B. Collenchyma :

Collenchyma is the typical supporting tissue of young herbaceous stems and leaf midribs. It is similar to parenchyma except that the primary cell wall is thickened to give greater mechanical strength.

نسيج داعم

في السيقان العشبية

C. Sclerenchyma:

Sclerenchyma is a hard supporting tissue with heavy secondary thickening. Sclerenchymatous cells are usually divided into two categories according to their aspect ratio. Sclereids (stone cells) are typically roughly isodiametric, although elongated and branched form also occurs. They may be found singly, in groups, or as a complete layer.

نسيج داعم

Sclerenchyma
Sclereids Fibers

Fibers are typified by high length-to-width ratio. They are usually thick walled and have a narrow lumen and pointed ends. Fibers are usually classified according to the area in which they occur as pericyclic, xylem and phloem fibers. A crystal sheath is sometimes formed around sclerenchyma, and this feature together with the size, frequency, and distribution of the cells, is often of diagnostic significance.

تصنف الألياف حسب المنطقة التي توجد فيها في النباتات

phloem xylem pericyclic

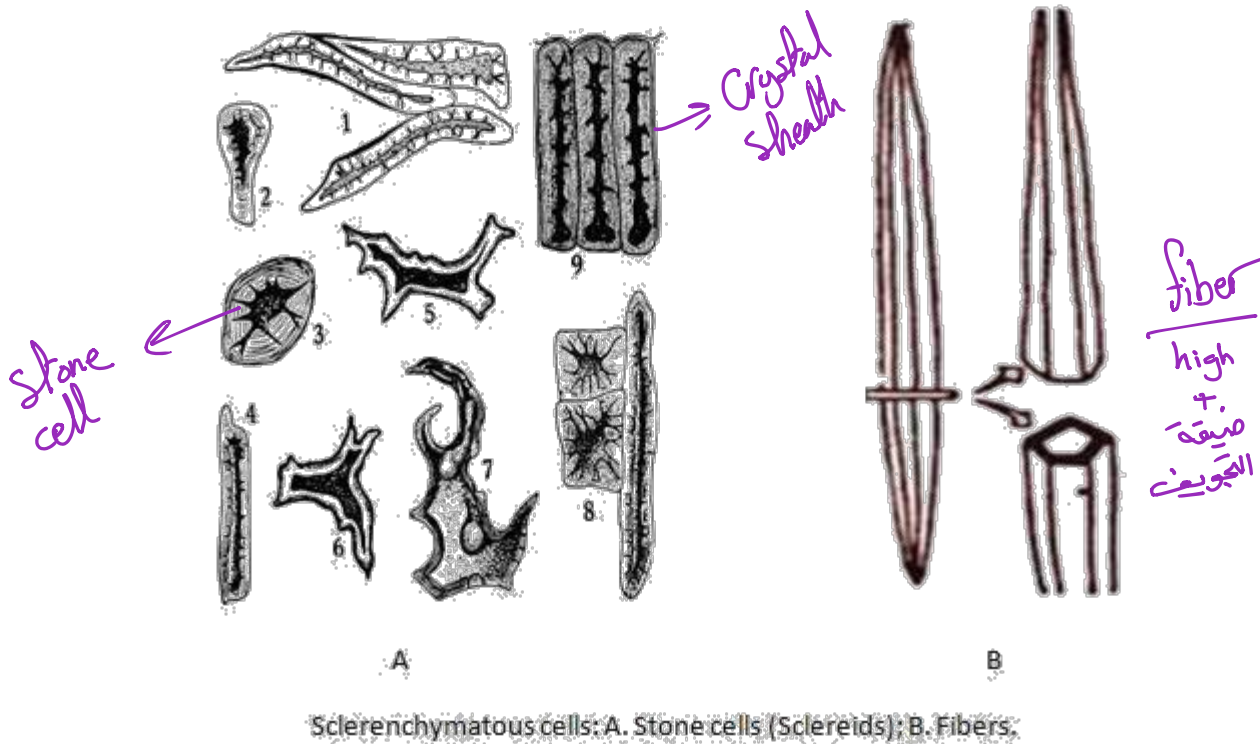
PARENCHYMA	COLLENCHYMA	SCLERENCHYMA
		
● thin cell wall	● uneven thickening of cell wall	● even thickening of cell wall

very thin
Intracellular يوجد

يعني في Thinning هون
بس منه بشكل متساوي
بكل مكان

هون في thickening
وبكل مكان

heavy secondary thickening

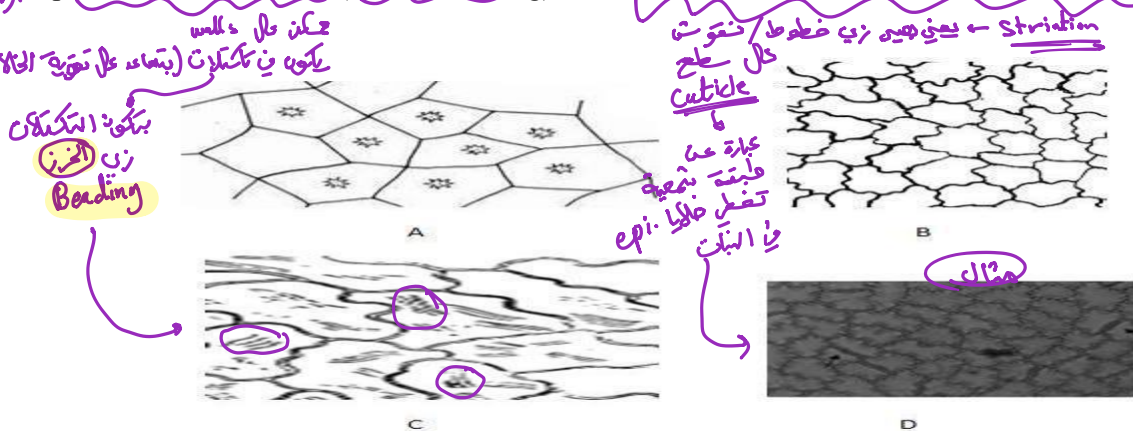


2-Dermal Tissue System:

A. Epidermis:

This is the outer most layer of the plant structure and it is usually one cell thick. In many cases the epidermal cells on the two surfaces of a leaf differ in form. Important diagnostic features include the shape of the anticlinal (vertical) and periclinal (horizontal) walls (e.g. straight or wavy), the presence of thickening (such as beading), and occurrence of striations on the surface cuticle.

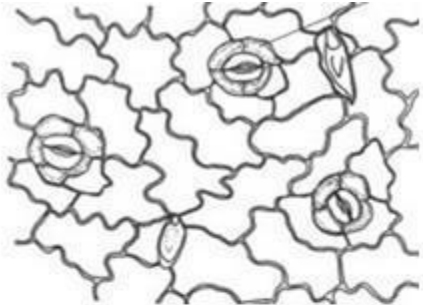
من الخصائص التي تميز epi. عن كالي.



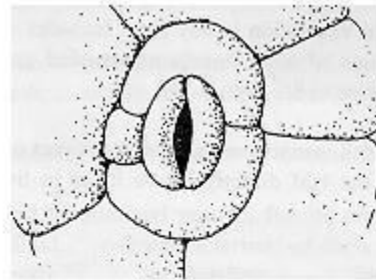
Epidermal cells: A. Straight-walled polygonal; B. Wavy-walled; C. Beaded; D. Slightly wavy with striated cuticle.

Several highly specialised and distinctive structures are dispersed among the relatively epidermal cells. The most universal of these are stomata, which control water loss from the plant. They occur most frequently on young leaves and stems, but can also be found on other organs such as flowers. A stoma consists of a pore surrounded by two guard cells

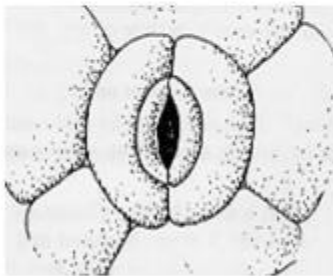
بفتحة ذب
حارس



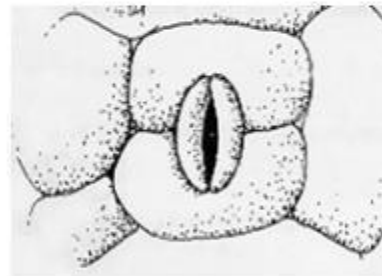
A



B



C



D

Types of arrangement of epidermal cells around stomata: A. Anomocytic; B. Anisocytic; C. Paracytic;

D. Diacytic

Trichomes are highly variable outgrowths of epidermal cells which can occur in all parts of the plant. They include glandular (secretory) and non-glandular (protective) types and may be uni- or multicellular.

يمكن لامتصاصها في جميع اجزاء النبات

يمكن تكون
unicellular
احادية الخلية

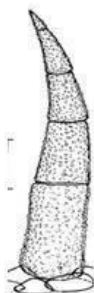
أو
عددية خلايا



A



B



C



D

Examples of epidermal trichomes: A. Glandular with bicellular head and unicellular stalk; B.

B.

Endodermis:

A specialized layer of cells which is found typically in ^①roots and ^②rhizomes and in ^③certain stems.

It marks the inner edge of the cortex.

C.

Periderm:

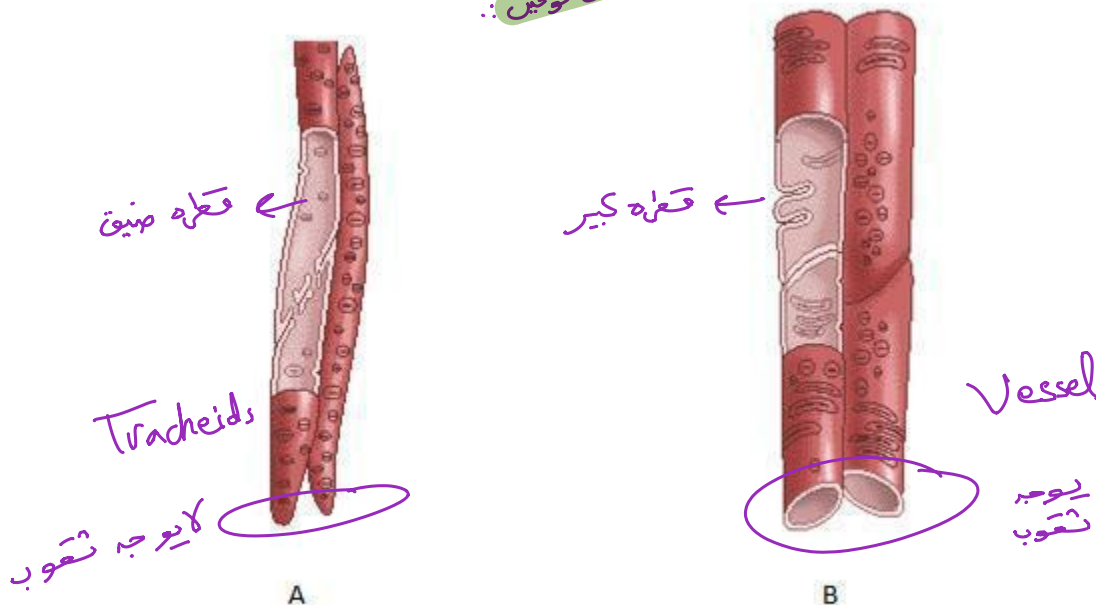
Periderm is a ^{واقي} protective tissue which replaces the epidermis in stems and roots which have ^{نسيج بيل عمل (epi) في root و stem} continual secondary growth. It is formed from the cork cambium (^①phellogen) which produces cork (^②phellem) on the outside and secondary cortex (phelloderm) on the inside.

3-Vascular Tissue System:

It is concerned with ^{نقل} transmission of material in the plant and represents (stellar structures) like xylem and phloem; they are responsible for the conduction of water and food material in plant.

A. Xylem:

The principal ^{النسيج المسطوح عن} water-conducting tissue of a plant. Xylem is a compound tissue made up of parenchyma, fibers, and tracheary elements (^④tracheids and ^⑤vessel members).



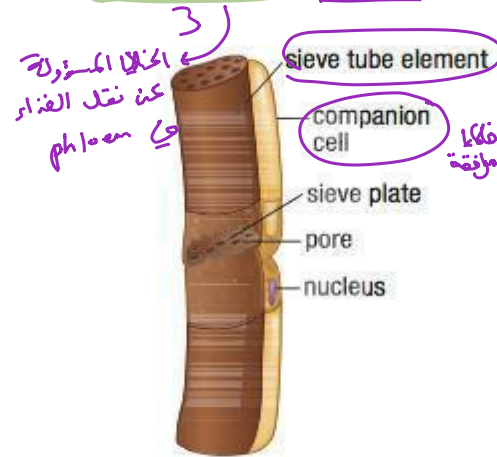
Tracheary elements: A. Tracheids showing only pitting and no perforation; B. Vessel member showing perforation.

يوجد ثقوب

عدم وجود ثقوب

B. Phloem:

Phloem is also a compound tissue and it is responsible for the transport of food. It contains parenchyma, sclerenchyma, and sieve elements (sieve tubes and companion cells).



Sieve elements: Sieve tube and companion cell.

أوليت

B. Preliminary Tests of Powdered Drugs:

1. Organoleptic Tests:

Note the color :

- White: acacia.
- Light yellow: liquorice, squill.
- Light brown: cardamom .
- Brown: cinnamon.
- Dark brown: clove
- Green: senna.
- Orange: rhubarb.

Note the odor:

- Ginger
- Clove
- Cinnamon
- Thyme
- Peppermint

Note the taste.

- Aromatic: cardamom, cinnamon, clove.
- Aromatic and pungent: ginger.
- Bitter: quassia, gentian.
- Sweet: liquorice.

Important Note:

Students should not taste powdered drugs without the consent of the supervisor. Adulterated or spoiled drugs may be harmful, others such as capsicum are too pungent to taste, and alkaloid-containing drugs are poisonous.

بدون موافقة المشرف
ممنوع التذوق
لأنه يمكنه الأدوية
تكون فاسدة أو
مفسدة أو مخرقة
أو حارة زكي الغلاف.

الغلاف

حارة جدا

مخرقة

سامة

مطلوب حفظهم

2. Physical Tests:

Examples:

- **Water Solubility:**

Mix a small quantity of powder with a few drops of water and allow to stand.

Aqueous extracts and **inspissated juices** such as **aloes** dissolve almost completely, while the **gummy or mucilaginous nature** of drug such as **acacia** and **linseed** becomes apparent.

الكالويثرا
إذا ذوبناها
في ماء
روح تنوب

- **Volatility:**

Press a small quantity of powder between two filter papers. An oily stain, spreading but persisting when the paper is heated in an oven, occurs with powders containing **fixed oils** (e.g.: Linseed, black mustard seed). **Volatile oils** will give a stain, disappearing on heating in an oven. (e.g.: Clove flower, thyme leaf).

- **Frothing Test** (detects the presence of **saponins**) :

Shake a little powder in a half a test-tube full of water, and if any marked frothing occurs, suspect saponin-containing drugs (e.g.: liquorice root).

إذا حدث رغوة ← يعني الدواء يحتوي على saponin

3. Chemical Tests:

Examples:

- **Mayer's test** : (detects **alkaloids**)
 $\text{HgCl}_2 + \text{KI} + \text{H}_2\text{O} + \text{plant powder} = \text{white ppt.}$
- **FeCl₃ test** : (detects **tannins**)
 $\text{FeCl}_3 + \text{plant powder} = \text{dark green color.}$
- **Borntrager's test** : (detects **free oxidized anthraquinones**)
 $\text{KOH} + \text{plant powder} = \text{pink to red color.}$

مطلوب
حفظهم

مطلوب
حفظهم

النتائج

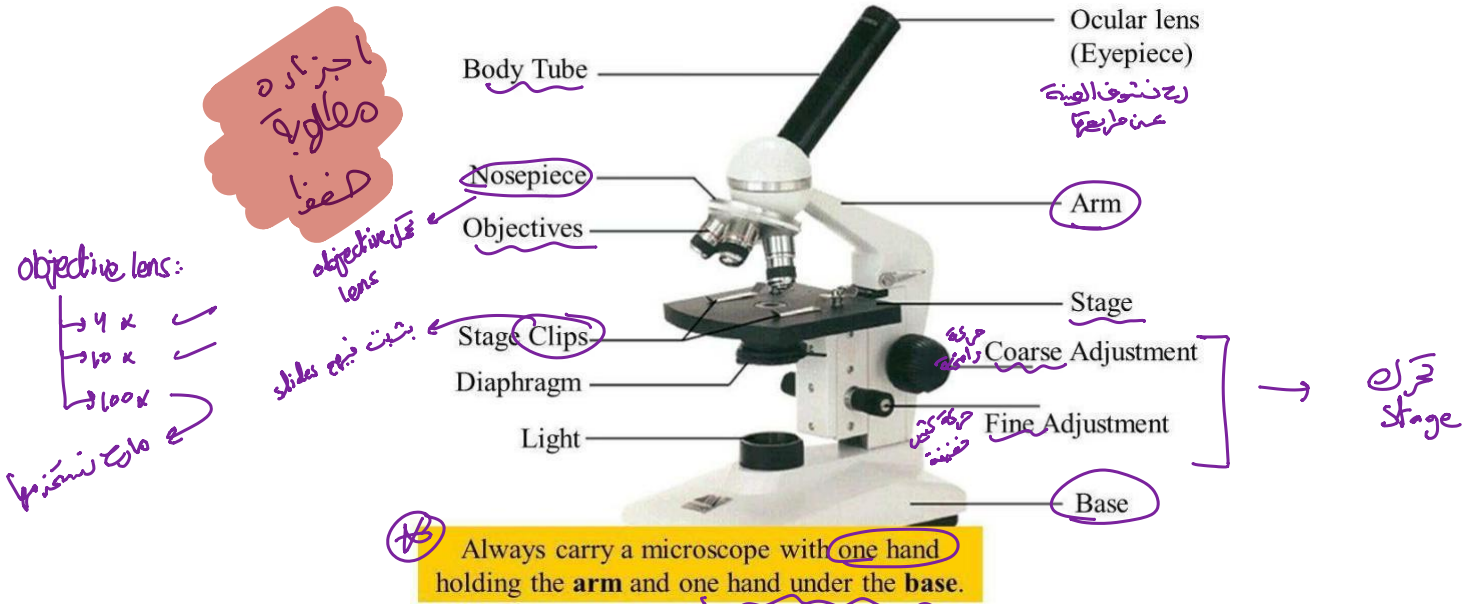
* يا إمارح ريس في بقعة رمانه
دفع مثل موجودة عندنا تيم السخف
في الزيت
Fixed oil ←
* أما أزه غايلا
بتعطى بقعة وعند التسخين
بتختفي

C. The Microscope:



Structure of microscope:

کل بنیة المایکروسکوپ
تجزیه من جزها
از نشوونمای المایکروسکوپ



1. **Eyepiece:** where you look through to see the image.
2. **Body tube:** long tube that holds the eyepiece and connects it to the objectives.
3. **Nosepiece:** the rotating part of the microscope at the bottom of the body tube; it holds the objective lenses.
4. **Objective lenses:** they vary in length (the shortest has the lowest power of magnification; the longest has the highest power of magnification).
5. **Arm-part:** you carry the microscope with it.
6. **Coarse adjustment knob:** large, round knob on the side of the microscope. Used for focusing the slide.
7. **Fine adjustment knob:** small, round knob on the side of the microscope, used to fine-tune the focus after using the coarse adjustment knob.
8. **Stage:** large, flat area under the objectives, where the sample or specimen is placed for examination.
9. **Light source:** usually found near the base of microscope.



Microscopical technique and reagents:

For microscopical observation a small sample is placed on a glass slides and dispersed in a suitable mountant (any substance in which a specimen is suspended between a slide and a cover glass for microscopic examination)

Solvent. This have a refractive index, which will give image contrast and may also clear the preparation by dissolving pigments or other substances.

A cover slip is gently placed on top of the preparation thus trapping the particles.

a) Reagents (mountants):

1. Chloral hydrate solution: is particularly useful for the examination of dried plant materials as it acts as a clearing agent and also expands shrunken cells to restore their natural shape. This mountant removes certain characters such as: starch, but it does not affect calcium oxalate, oils or fats.
2. Glycerol: it is a non-drying mountant which has no solvent power. As it does not dissolve starch it is useful for the routine qualitative examination of starch.
3. Water: used for starch.
4. Phlorolucinol + HCL: used for lignified tissue.

b) Magnification:

Your microscope has 3 magnifications: Scanning, Low and High. Each objectives will written magnification. In addition to this, the ocular lens (Eyepiece) has a magnification. The total magnification = the ocular x objective.

	Magnification	Ocular lens	Total Magnification
Scanning	4x	10x	40x
Low Power	10x	10x	100x
High Power	40x	10x	400x

Self-reading:

متعارف اذا داخل أولا

Care of the microscope

1. Hold a microscope firmly by the stand, only. Never grab it by the eyepiece holder, for example.
2. Since bulbs are expensive, and have a limited life, turn the illuminator off when you are done.
3. Always make sure the stage and lenses are clean before putting away the microscope.
4. Never use a paper towel, your shirt, or any material other than good quality lens tissue or a cotton swab (must be 100% natural cotton) to clean an optical surface. Be gentle! You may use an appropriate lens cleaner or distilled water to help remove dried material. Organic solvents may separate or damage the lens elements or coatings.
5. Cover the instrument with a dust jacket when not in use.
6. Focus smoothly; don't try to speed through the focusing process or force anything. For example, if you encounter increased resistance when focusing then you've probably reached a limit and you are going in the wrong direction.

How to use microscopes:

1. Place your microscope on a secure table, free from vibration, to begin. Try to have the microscope at least one foot away from any edge to avoid an accidental fall.
2. Turn on the lamp and set the intensity for comfortable viewing.
3. Place a specimen slide on the stage.
4. You should now begin to learn an important skill that will significantly increase your enjoyment of the instrument. You must learn to view through the eyepiece(s) with both eyes open! Whether you have a monocular microscope (one eyepiece,) or a binocular microscope (two eyepieces,) start from the beginning to use both eyes.
5. Start from the beginning by low power (4 X).
6. If you wish to move to a higher power objective, it should take very little

movement of the fine adjustment knob to bring the image into focus.

Similarly,

a particle in the image which is centered in the field of view should remain in the center as objectives are changed.

7. Initially, slowly ^{التركيز البطيء} focus back (turn the fine focus knob to raise the optical tube) while looking through the eye piece. Once the specimen comes into focus, you can make fine adjustments up or down with the fine focus knob without fear of damaging the slide or the microscope.
8. If the specimen does not come into view (does not focus), raise the tube a little with the coarse focus knob and attempt to focus again with the fine focus knob. Once the object is in focus, switching objective lenses (to a higher power) should be possible without any further coarse adjustments.



Preparation of the Specimen:

1. Add the plant material in a clean slide.
2. Add few drops of chloral hydrate. ^{Solvent}
3. Put the cover slip on the slide in an angle 45° and lower slowly to drive out any air bubbles.
4. Before examination be sure that the area not covered by the cover slip is clean and dry. ^{cover slip لا يلمس باقي العينة}